

REMARKS

Claims 1-13 are pending herein. Applicants respectfully submit that all claims pending herein define patentable subject matter over the applied references for the reasons explained below, and request that a Notice of Allowance be issued for this application in due course.

1. The objection to the disclosure is noted, but deemed moot in view of the substitute specification paragraph filed herewith on page 2 of this Amendment. Accordingly, Applicants respectfully request that the above objection be reconsidered and withdrawn.

2. Claims 1-12 were rejected under §102(b) over Swierkowski. Applicants respectfully traverse this rejection.

Independent claim 1 recites a micropipette for dispensing sequential, different sample solutions. The micropipette includes at least one substrate and at least one inlet port through which the sample solutions are delivered from the outside, formed in or on the at least one substrate, and at least one cavity into which the sample solutions are poured and which is filled sequentially with the sample solutions. Each of the cavities has a plane passing through a center thereof when viewed in the depth direction, and each of the cavities has a width of about 0.1 to 1 mm and a depth of about 0.1 to 0.5 mm. The micropipette also includes an introduction hole between each inlet port and each cavity at a position at or below the plane, an injection port for sequentially expelling the sample solutions formed in communication with each cavity, and a piezoelectric/electrostrictive element provided on at least one wall of the substrate adjacent each cavity. The volume of each cavity is changed by driving each respective piezoelectric/electrostrictive element, and a certain amount of each sample solution in the cavity is expelled from each respective injection port. The width and depth of each cavity are selected to reduce mixing of the sequential sample solutions within each cavity.

The PTO asserted that Swierkowski "generally is drawn to dispensing of sequential sample arrays (Abstract and column 1, lines 35-41)" and that Swierkowski also discloses "inlet ports 19, introduction holes 29 that lie at or below the plane of cavities 27, piezoelectric elements 44/39 adjacent cavity walls that propel fluid by controlling the shape and volume of

the cavities, the cavities having the claimed dimensions (column 5, lines 33-60 and column 6, lines 22-29)" (Office Action, page 2, lines 19-23). Applicants respectfully disagree with the PTO's characterization of the disclosure of Swierkowski with respect to both function and structure.

With respect to the PTO's allegation that Swierkowski is functionally "drawn to dispensing of sequential sample arrays," Applicants respectfully submit that Swierkowski does not, in fact, disclose or suggest dispensing sequential, different sample solutions that are delivered to the cavities of the micropipette from the outside via an inlet port, as recited in claim 1. That is, Swierkowski's Abstract and Col. 1, lines 35-41, on which the PTO relied, merely relate to biological sample handling and chemical analysis applications, for example. Swierkowski teaches that the dispensing devices discussed in Column 1 are used to rapidly dispense fluid samples in precise sizes and locations using computer control mechanisms to produce arrays of samples for miniaturized chemical experiments. Applicants respectfully submit that the "sequential chemical reactants" mentioned in this portion of Swierkowski's disclosure actually relate to the dispensing sequence of the chemical reactants onto the testing medium, but Swierkowski does not teach that such reactants are sequentially filled into cavities of the micropipette and sequentially expelled from the cavity in a seamless manner, as in the case of the invention recited in claim 1. In fact, Swierkowski teaches that these chemical reactants are either "combined or just placed, separately or jointly, for subsequent processing or analysis" (see Swierkowski, Col. 1, lines 38-40).

Three are also structural differences between the claimed invention and Siwerkowski. Referring to Swierkowski's Figs. 1-3, Applicants respectfully submit that the piezoelectric driver 39 (shown in Swierkowski's Figs. 2 and 3, for example) is not provided on the wall of the Si member 11 adjacent each of the sequential cavities, including 19 (fill well), 23 (dead well) and 27 (driven well), as recited in independent claim 1. That is, in Swierkowski's Fig. 1, only the driven wells 24, 25, 26 and 27 are respectively provided with piezoelectric drivers 36, 37, 38 and 39, whereas the dead wells 20, 21, 22 and 23 and the fill wells 16, 17, 18 and 19 are not provided with any piezoelectric drivers.

Further, Applicants respectfully submit that there is no disclosure or suggestion in Swierkowski that the dimensions of each of the cavities have a width in a range of 0.1mm to

1mm and a depth in a range of 0.1mm to 0.5mm, as recited in claim 1. That is, although the PTO cited to Column 5, lines 33-60 and Column 6, lines 22-29 of Swierkowski as allegedly disclosing the claimed dimensions, Applicants respectfully submit that these passages of Swierkowski relate only to the dimensions of the microcapillaries 12, 13, 14 and 15, which comprise only a lowermost portion of the cavities as shown in Figs. 2 and 3 of Swierkowski. Applicants respectfully submit that these passages of Swierkowski do not relate to the dimensions of the remainder of any of the cavities (in particular, especially not the driven wells 24, 25, 26 and 27 that are provided with the piezoelectric drivers).

According to Swierkowski, when the driven well is compressed, fluid that is introduced into the system via the fill wells is allegedly more easily ejected from the nozzle. The dead wells act as large inertial masses to prevent backfiring, and this geometry allegedly promotes a one-way pumping action without requiring any moving parts. The capillaries are allegedly naturally refilled by capillary surface tension so the system allegedly ejects drops quickly and then the exit capillary refills itself slowly from the entire fluid pack. Swierkowski also recites that "this is not a rapid rate system" (see Swierkowski, Col. 5, line 66 -- Col. 6, line 20).

In view of the above, Applicants respectfully submit that the nozzle/exit orifice portion of Swierkowski's structure, shown on the far right-side portions of Swierkowski's Figs. 2 and 3, for example, cannot be taken in isolation from the remainder of the structures shown in these Figures. That is, even if the PTO were to assert that this right-side portion of Swierkowski's structure alone included all of the elements of independent claim 1, and even if portions of the orifice 29 arguably correspond to an inlet port and an introduction hole, the inlet port portion of orifice 29 is still not an inlet port through which sequential sample solutions are delivered from the outside, as recited in claim 1.

Thus, Applicants respectfully submit that one of ordinary skill in the art would not have been motivated to modify Swierkowski's structure such that sample solutions would be delivered "from the outside" directly to the driven well 27 via the orifice 29, since modifying the structure in that manner would essentially eviscerate the entire teaching of Swierkowski (i.e., providing the series of fill wells, dead wells and driven wells in correlation with the micro capillaries to provide one-way pumping action without any moving parts).

Further, although the PTO asserted that Swierkowski also discloses the subject matter recited in dependent claims 10, 11 and 12 (see page 3, lines 4-5 of the Office Action), Applicants respectfully submit that this assertion is incorrect. That is, Applicants respectfully submit that there is no disclosure or suggestion in Swierkowski that either the Si member 11 or the glass substrate 10 are made of zirconia ceramics.

For at least the foregoing reasons, Applicants respectfully submit that all claims pending herein define patentable subject matter over Swierkowski. Accordingly, Applicants respectfully request that the above rejection be reconsidered and withdrawn.

3. Claim 13 was rejected under §103(a) over Swierkowski in view of Takeuchi. Applicants respectfully traverse this rejection.

Dependent claim 13 depends from claim 1, which is discussed above in section 2. Since claim 1 defines patentable subject matter over the applied references for the reasons explained above in section 2, Applicants respectfully submit that claim 13 likewise defines patentable subject matter over the applied references by virtue of its dependence from independent claim 1. Accordingly, Applicants respectfully request that the above rejection be reconsidered and withdrawn.

If the Examiner believes that contact with Applicants' attorney would be advantageous toward the disposition of this case, the Examiner is herein requested to call Applicants' attorney at the phone number noted below.

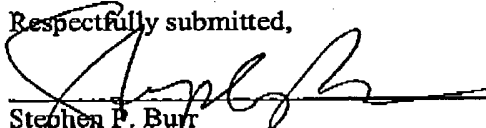
The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-1446.

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Date

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